

# JAMES FOULDS

## Curriculum Vitae

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## EDUCATION

- 2014 **Doctor of Philosophy**, *University of California, Irvine*, Computer Science.
- 2008 **Master of Science (with First Class Honours)**, *University of Waikato*, Hamilton, New Zealand, Computer Science.
- 2006 **Bachelor of Computing and Mathematical Sciences (with First Class Honours)**, *University of Waikato*, Hamilton, New Zealand, Major in Artificial Intelligence.  
*GPA: 8.92/9.0 (A+ average)*

## Research Statement

My research interests are broadly in the area of **socially conscious machine learning** and **artificial intelligence**. My work aims to improve AI's role in society regarding **fairness** and **privacy**, and to promote the practice of **computational social science**, using **probabilistic models** and **Bayesian inference**.

## Experience in Higher Education

- Aug 2017 – **Assistant Professor**, *University of Maryland, Baltimore County*, Baltimore, MD.  
present
- Sept 2015 – **Postdoctoral Scholar**, *UC San Diego*, California, USA.  
Aug 2017 UCSD ITA data science postdoctoral fellowship (an independent postdoc position).  
Privacy-preserving latent variable modeling. Primary collaborator: Professor Kamalika Chaudhuri
- 2016 – 2017 **Lecturer**, *University of California, San Diego*, La Jolla, CA.  
*CSE 291-D: Latent Variable Modeling*, Spring 2016 and Spring 2017.
- July 2014 – **Postdoctoral Scholar**, *UC Santa Cruz*, California, USA.  
July 2015 Latent variable modeling with probabilistic soft logic.  
Mentoring and advising seven graduate students. Supervisor: Professor Lise Getoor.
- Sept 2008 – **Research Assistant**, *UC Irvine*, California, USA.  
June 2014 Probabilistic modeling of social networks and text. Supervisor: Professor Padhraic Smyth.
- Apr – Aug **Research Assistant**, *University of Waikato*, Hamilton, New Zealand.  
2008 Multi-instance learning. Supervisor: Dr. Eibe Frank.  
2006 **Research Assistant**, *University of Waikato*, Hamilton, New Zealand.  
Text mining. Supervisor: Dr. Eibe Frank.
- 2005–2007 **Teaching Assistant**, *University of Waikato*, Hamilton, New Zealand.  
Logic and Computation, Critical Reasoning, Introduction to Logic, Logic and Programming, Introduction to Computer Science 1 & 2.
- 2003–2005 **Research Assistant**, *University of Waikato*, Hamilton, New Zealand.  
Cognitive robot mapping. Supervisor: Dr. Margaret Jefferies.

## Experience in Other than Higher Education

- June – Sept **Research Intern**, *Yahoo Labs*, Sunnyvale, California, USA.  
2013 Diverse personalized recommendation models. Supervisor: Dr. Dilan Görür.
- 2006-2007 **Software Engineer, WEKA**, *University of Waikato*, Hamilton, New Zealand.  
Waikato Environment for Knowledge Analysis (WEKA) Boundary Visualization Tool for visualizing classifier decision boundaries.
- 2006-2007 **Sole Developer/Designer**, *University of Waikato*, Hamilton, New Zealand.  
I developed an open-source Turing machine simulator for teaching purposes, for the University of Waikato, New Zealand. The source code is publicly available at <http://sourceforge.net/projects/tuataratmsim/>.

## Honors Received

- 2016 **Southern California Machine Learning Symposium**, Best presentation, runner-up.
- 2008 **UC Irvine ICS Dean's Fellowship**, \$18,000 USD, covered my 1st year tuition fees.
- 2007 **University of Waikato Masters Research Scholarship**, \$12,000 NZD.
- 2007 **University of Waikato SCMS Scholarship**, \$3000 NZD.
- 2006 **Ramanujan Centenary Prize**, *University of Waikato School of Computing and Mathematical Sciences (SCMS)*, for best overall performance in the BCMS degree.
- 2006 **Best Honours Project Award**, *University of Waikato Department of Computer Science*, for best Honours research project.
- 2006 **Prior Society Prize in Philosophy**, Runner up, highly commended.
- 2006 **New Zealand Computer Society Level 3 Tertiary Scholarship**, \$2500 NZD.
- 2006 **University of Waikato SCMS Honours Study Award**, \$3000 NZD.
- 2005 **2nd in New Zealand/10th in Australasia**, *ACM South Pacific Programming Contest*.
- 2002 **University of Waikato Department of Computer Science Entrance Scholarship**, covered my 1st year tuition fees.

## Courses Taught

- 2018 **Probabilistic Machine Learning (UMBC, Fall)**.
- 2018 **Data Mining (UMBC, Spring)**.
- 2017 **Data Mining (UMBC, Fall)**.
- 2017 **Latent Variable Models (UCSD, Spring)**.
- 2016 **Latent Variable Models (UCSD, Spring)**.

## Professional Development

- 2019 **Active Learning and Inquiry Teaching (ALIT) Certificate**, *University of Maryland*,  
(expected) *Baltimore County*, Baltimore, MD.  
A two-year program for faculty who are interested in incorporating evidence-based teaching methods into their classes.
- 2018 **New Computing Faculty Teaching Workshop**, *University of California, San Diego*, La Jolla, CA.  
The goal of the workshop is to help new computing faculty to be better and more efficient teachers. The workshops were described in Communications of the ACM in the May 2017 issue.
- 2016 **CIRTL Associate**, *University of California, San Diego*, La Jolla, CA.  
Center for the Integration of Research, Teaching and Learning (CIRTL) Associate level of achievement awarded after completing *The College Classroom* pedagogy course.

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## RESEARCH SUPPORT AND/OR FELLOWSHIPS

### Awarded Grant Proposals

2018–2019 \$101,402, National Institute of Standards (NIST) MSE 60NANB18D227, PI: **James Foulds**; coPI: Shimei Pan, *Differential Fairness for Artificial Intelligence and Machine Learning Systems: Unbiased Decisions with Biased Data*

### Proposals Currently Under Submission

2019–2021 \$174,869, National Science Foundation (NSF), PI: **James Foulds**, *CRII: RI: A Little Uncertainty is Good for Everyone: Bayesian Models for Fairness, and Fairness for Bayesian Models (under submission)*

2019–2021 \$151,846, MITRE / University System of Maryland (USM) National Cybersecurity FFRDC FY19 Cybersecurity Research Program, PI: Shimei Pan; CoPIs: Zhiyuan Chen, **James Foulds**, *Improving the Security and Usability of Cross-Domain Fallback Authentication with Adversarial Learning (under submission)*

2019–2022 \$499,615, National Science Foundation (NSF), PI: Nirmalya Roy; CoPI: **James Foulds**; Aryya Gangopadhyay, III: *Small: SocialAnnotator: Selecting Efficient Data Annotators by Exploiting Social Relationships and Contexts*

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## PUBLICATIONS, PRESENTATIONS, AND CREATIVE ACHIEVEMENTS

### Works Submitted or in Preparation

J. R. Foulds, R. Islam, K. Keya, and S. Pan. Bayesian modeling of intersectional fairness: The variance of bias. *AAAI/ACM Conference on AI, Ethics, and Society (AIES 2019, under submission)*, 2019.

J. T. Morton, A. Aksenov, L.-F. Nothias-Scaglia, J. R. Foulds, R. Quinn, B. Anderson, S. J. Song, R. Dutton, P. Dorrestein, and R. Knight. Perceptions into microbe-metabolite interactions with perceptrons. *23rd Annual International Conference on Research in Computational Molecular Biology (RECOMB 2019, under submission)*, 2019.

N. Pathak, J.R. Foulds, N. Roy, N. Banerjee, and R. Robucci. A Bayesian data analytics approach to buildings' thermal parameter estimation. *IEEE International Conference on Pervasive Computing and Communication (PerCom 2019, under submission)*, 2019.

J. R. Foulds and S. Pan. An intersectional definition of fairness. *ArXiv preprint arXiv:1807.08362 [CS.LG]*, 2018.

M. Park, J. R. Foulds, K. Chaudhuri, and M. Welling. Variational Bayes in private settings (VIPS). *ArXiv preprint arXiv:1611.00340 [stat.ML]*, 2016.

### Peer-Reviewed Conference Papers

J. R. Foulds. Mixed membership word embeddings for computational social science. *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.

M. Park, J. R. Foulds, K. Chaudhuri, and M. Welling. DP-EM: Differentially private expectation maximization. *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2017.

- J. R. Foulds, J. Geumlek, M. Welling, and K. Chaudhuri. On the theory and practice of privacy-preserving Bayesian data analysis. In *Proceedings of the 32nd Conference on Uncertainty in Artificial Intelligence (UAI)*, 2016.
- A. Grycner, G. Weikum, J. Pujara, J. R. Foulds, and L. Getoor. RELLY: Inferring hypernym relationships between relational phrases. In *Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pages 971–981, Lisbon, Portugal, September 2015. Association for Computational Linguistics.
- S. Fakhraei, J. R. Foulds, M. Shashanka, and L. Getoor. Collective spammer detection in evolving multi-relational social networks. In *Proceedings of the 21st ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2015.
- J. R. Foulds, S. H. Kumar, and L. Getoor. Latent topic networks: A versatile probabilistic programming framework for topic models. In *Proceedings of The 32nd International Conference on Machine Learning (ICML)*, 2015.
- X. He, T. Rekatsinas, J. R. Foulds, L. Getoor, and Y. Liu. HawkesTopic: A joint model for network inference and topic modeling from text-based cascades. In *Proceedings of the 32nd International Conference on Machine Learning (ICML)*, 2015.
- P. Kouki, S. Fakhraei, J. R. Foulds, M. Eirinaki, and L. Getoor. HyPER: A flexible and extensible probabilistic framework for hybrid recommender systems. In *Proceedings of the 9th ACM Conference on Recommender Systems (RecSys)*, 2015.
- A. Ramesh, S. H. Kumar, J. R. Foulds, and L. Getoor. Unsupervised models of aspect-sentiment for online course discussion forums. In *Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2015.
- D. Sridhar, J. R. Foulds, B. Huang, M. Walker, and L. Getoor. Joint models of disagreement and stance in online debate. In *Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2015.
- J. R. Foulds and P. Smyth. Annealing paths for the evaluation of topic models. In *Proceedings of the Thirtieth Conference Conference on Uncertainty in Artificial Intelligence (UAI)*, 2014.
- J. R. Foulds and P. Smyth. Modeling scientific impact with topical influence regression. In *Proceedings of the 2013 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pages 113–123, Seattle, Washington, USA, October 2013. Association for Computational Linguistics.
- J. R. Foulds, L. Boyles, C. DuBois, P. Smyth, and M. Welling. Stochastic collapsed variational Bayesian inference for latent Dirichlet allocation. In *Proceedings of the 19th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2013.
- C. DuBois, J. R. Foulds, and P. Smyth. Latent set models for two-mode network data. In *Proceedings of the 5th International AAAI Conference on Weblogs and Social Media (ICWSM)*, 2011.
- J. R. Foulds, A. Asuncion, C. DuBois, C. T. Butts, and P. Smyth. A dynamic relational infinite feature model for longitudinal social networks. In *Proceedings of the 14th International Conference on AI and Statistics (AISTATS)*, 2011.

J. R. Foulds, N. Navaroli, P. Smyth, and A. Ihler. Revisiting MAP estimation, message passing and perfect graphs. In *Proceedings of the 14th International Conference on AI and Statistics (AISTATS)*, 2011.

J. R. Foulds and P. Smyth. Multi-instance mixture models and semi-supervised learning. In *SIAM International Conference on Data Mining (SDM)*, 2011.

J. R. Foulds and E. Frank. Speeding up and boosting diverse density learning. In *Proceedings of the 13th International Conference on Discovery Science (DS)*, 2010.

J. R. Foulds and E. Frank. Revisiting multi-instance learning via embedded instance selection. In *Proc. 21st Australasian Joint Conference on AI (AI)*, 2008.

#### Peer-Reviewed Journal Papers

Y. Papanikolaou, J. R. Foulds, T. N. Rubin, and G. Tsoumakas. Dense distributions from sparse samples: Improved Gibbs sampling parameter estimators for LDA. *Journal of Machine Learning Research*, 18(62):1–58, 2017.

J. R. Foulds and E. Frank. A review of multi-instance learning assumptions. *Knowledge Engineering Review*, 25(1), 2010.

J. R. Foulds and L. R. Foulds. Bridge lane direction specification for sustainable traffic management. *Asia-Pacific Journal of Operational Research*, 23(2), 2006.

J. R. Foulds and L. R. Foulds. A probabilistic dynamic programming model of rape seed harvesting. *International Journal of Operational Research*, 1(4), 2006.

#### Peer-Reviewed Workshop and Symposium Papers

T. Ghiwaa and J. R. Foulds. Training WGANs with peer instruction. In *Mid-Atlantic Student Colloquium on Speech, Language and Learning*, 2018.

R. Islam and J. R. Foulds. Towards a highly efficient online inference algorithm for latent Dirichlet allocation. In *Mid-Atlantic Student Colloquium on Speech, Language and Learning*, 2018.

K. Keya and J. R. Foulds. Neural embedding allocation: Distributed representations of words, topics, and documents. In *Mid-Atlantic Student Colloquium on Speech, Language and Learning*, 2018.

J. R. Foulds. Mixed membership word embeddings. In *SoCal Machine Learning Symposium (SCMLS)*, 2016.

M. Park, J. R. Foulds, K. Chaudhuri, and M. Welling. Private topic modeling. *NIPS Workshop on Private Multi-Party Machine Learning (PMPML)*, 2016.

A. Grycner, G. Weikum, J. Pujara, J. R. Foulds, and L. Getoor. A unified probabilistic approach for semantic clustering of relational phrases. In *4th Workshop on Automated Knowledge Base Construction (AKBC)*, 2014.

D. Sridhar, J. R. Foulds, B. Huang, M. Walker, and L. Getoor. Collective classification of stance and disagreement in online debate forums. In *Bay Area Machine Learning Symposium (BayLearn)*, 2014.

J. R. Foulds and D. Görür. Diverse personalization with determinantal point process eigenmixtures. In *NIPS Workshop on Personalization*, 2013.

J. R. Foulds and P. Smyth. Robust evaluation of topic models. In *NIPS Workshop on Topic Models*, 2013.

J. R. Foulds and P. Smyth. Modeling scientific impact with topical influence regression. In *NIPS Workshop on Algorithmic and Statistical Approaches for Large Social Network Data Sets*, 2012.

### Theses

J. R. Foulds. *Latent Variable Modeling for Networks and Text: Algorithms, Models and Evaluation Techniques*. PhD thesis, University of California, Irvine, 2014.

J. R. Foulds. Learning instance weights in multi-instance learning. Master's thesis, University of Waikato, Hamilton, New Zealand, 2008.

J. R. Foulds. Learning to play the game of Go. Honours thesis, University of Waikato, Hamilton, New Zealand, 2006.

### Presentations

*Note: All conference and workshop publications were presented at the event, either by myself or by a student co-author. This list contains additional invited presentations.*

- Nov. 2018 Johns Hopkins University, Center for Language and Speech Processing (CSLP) Seminar
- Nov. 2018 Artificial Intelligence Maryland (MD-AI) Seminar, Emerging Technology Centers (ETC), Baltimore, MD
- Nov. 2018 Federal Trade Commission (FTC) hearing on Artificial Intelligence and Algorithmic Decision Tools, Howard University School of Law, Washington, DC
- Oct. 2018 AAAI Fall Symposium on AI for Government and Public Sector Applications, Arlington, VA
- Sept. 2018 Networking and Information Technology Research and Development (NITRD) Interagency Working Group on Privacy R & D, National Coordination Office, Washington, DC
- Sept. 2018 George Mason University, UMBC Group Visit on Cognitive Computing
- June 2018 ICWSM 2018 tutorial: Generative Models for Social Media Analytics: Networks, Text, and Time (with Kevin Xu), Stanford, CA
- June 2018 National Institute of Standards (NIST) Gaithersburg, AI Community of Interest Seminar
- April 2018 UMBC, ACM Faculty Seminar
- Feb 2018 UMBC, Discussant for a screening of the AlphaGo documentary
- March 2017 University of Maryland – Baltimore County
- March 2017 Oregon State University
- March 2017 Tulane University
- March 2017 UC Riverside
- Feb. 2017 Boston College
- Feb. 2017 California State University – Long Beach
- Jan. 2017 UCSD, Artificial Intelligence Seminar
- July 2016 SBP-BRIMS 2016 invited tutorial: Generative Models for Social Network Data (with Kevin Xu), UCDC, Washington DC
- May 2016 USC, Artificial Intelligence Seminar
- April 2016 UCSD, Angela Yu's lab
- Jan. 2016 UCI, Center for Machine Learning and Intelligent Systems Seminar

Nov. 2015 UCSD, Artificial Intelligence Seminar  
April 2015 Banff International Research Station (BIRS), New Perspectives for Relational Learning  
August 2014 eBay Research Labs

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## SERVICE TO THE DEPARTMENT, UNIVERSITY, COMMUNITY, AND PROFESSION

### **Organizational Roles.**

Workflow Chair, Artificial Intelligence and Statistics (AISTATS) 2019 conference

Co-Chair, Information Theory and Applications (ITA) 2016–2017

### **Ph.D. Committee Member.**

Neha Singh, comprehensive exam 10.24.2018.

Timothy Casey, comprehensive exam 10.11.2018.

Bipendra Basnyat, comprehensive exam 10.5.2018.

H M Sajjad Hossain, proposal defense 11.27.2017.

Nilavra Pathak, proposal defense 11.15.2017.

2018 **Conference Program Committee Reviewer**, *NAACL, ACL, ICML, IJCAI, UAI, WWW BigNet Workshop*.

2017 **Conference Program Committee Reviewer**, *ICML, ICLR, IJCAI, UAI, ACL*.

2016 and **Conference Program Committee Reviewer**, *NIPS, ICML, AAI, IJCAI, AISTATS,*  
earlier *UAI, ACL, NAACL, WWW, ICRA, IEEE BigData, NIPS Topic Models Workshop*.

2017 **Grant Proposal Reviewing**, National Fund for Scientific and Technological Development (FONDECYT) of the Chilean National Commission for Scientific and Technological Research (CONICYT), 2018 FONDECYT Regular Competition.

2018 **Journal Reviewing**, *TACL*.

2017 **Journal Reviewing**, *MLJ, TACL, FGCS*.

2016 and **Journal Reviewing**, *JMLR, JAIR, Annals of Applied Statistics, Neural Computation, MLJ,*  
earlier *AIJ, ACM TIST, TACL, IEEE TNNLS, IEEE TKDE, DAMI, SWJ, CAMWA*.

2007–2008 **Problem Sponsor/Problem Reviewer**, *ACM South Pacific Region Programming Contest 2007*.

2007 **Problem Sponsor/Reviewer**, *New Zealand Programming Contest 2007*.

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## MISCELLANEOUS

Citizenship U.S. and New Zealand dual citizenship.

Trivia My Erdős number is two (J. R. Foulds - L. R. Foulds - P. Erdős)

ACM Executive Committee member for the University Waikato ACM Student Chapter 2005–2008.